

# designideas

make some changes in the hardware and software. The changes necessary to the hardware are obvious, and you may need to change the software

source code of the application to correct the *for (...)* loop statement according to the timing diagram of the selected part. **EDN**

## Perform bitwise operation in Excel spreadsheets

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Microsoft's ([www.microsoft.com](http://www.microsoft.com)) Excel helps engineers with calculus and graphics to solve problems. But engineers often have to perform bitwise operations, too. Figure 1 shows the bitwise operations' tables. The bitwise functions work for decimal values. If you need to use hexadecimal or binary values, you must use the Dec2Bin and Dec2Hex functions to convert all the decimal values for the desired format.

To install the add-in bitwise functions, you can download the *ins.xla* file from the Web version of this De-

sign Idea at [www.edn.com/081030di2](http://www.edn.com/081030di2). In Excel, go to Tools, then Add-Ins, and then Browser. Find the downloaded add-in *xla* file and click OK. Now, Excel can run the bitwise functions.

You can also download some examples from the EDN Web site at [www.edn.com/081030di2](http://www.edn.com/081030di2) (**Reference 1**). **EDN**

### REFERENCE

1 Kagan, Aubrey, *Excel by Example: A Microsoft Excel Cookbook for Electronics Engineers*, Newnes Elsevier, 2004, ISBN 0-7506-7756-2.

AND	RESULT
0 0	0
1 0	0
0 1	0
1 1	1

OR	RESULT
0 0	0
1 0	1
0 1	1
1 1	1

XOR	RESULT
0 0	0
1 0	1
0 1	1
1 1	0

NOT	RESULT
0	255
1	254

SHIFT RIGHT	RESULT
BINARY	SHIFTED BINARY
11010010	6 00000011

SHIFT LEFT	RESULT
BINARY	SHIFTED BINARY
01100100	2 10010000

Figure 1 With the help of some new add-in functions, you can perform these bitwise operations in Excel.

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